Frankly Speaking

Congress Paves the Way

THE transition from war to peace is essentially a difficult task. For years the nation has marshaled its wealth, its strength and its industries for total war.

We cannot hope, then, to change from the pursuits of military might to a normal way of life overnight. The movement must be ordered and not too hurried. We must in fact first lay the groundwork. What is more, attention must be given to our most pressing needs.

Perhaps no single phase of our national economic well-being demands quicker relief than our highway systems. For several years, even prior to the war, many of these systems were inadequate and badly neglected.

Congress is cognizant of these facts. They recognize, too, the waste and loss that are bound to ensue if the yields of the fields and the products of industry are not readily transported to consumers. Accordingly within the past few weeks the Congress enacted legislation known as Resolution #81. In so doing certain monies of the highway fund were freed and a program of highway expansion outlined.

The program provides for Federal participation in road building throughout the nation. It is of a three-fold nature and is divided into Federal Aid, Federal Aid Secondary and Urban highway development. The total expenditure will consist of a $1,500,000,000 grant over a period of three years. The first $500,000,000 is already available.

The project is no glorified relief. It is a work of a substantial nature.

Plans for trunk highways are well advanced in many states. But what of the urban areas? The districts where bottle-necks abound? It will profit little to open up great avenues if at their termini everything is to be choked.

Urban-area improvements are then our most immediate and pressing need. Of the 348 billion miles of motor vehicle travel in the United States in 1941, over half of it was on the 10% of the roads made up of city streets. In fact in some instances it is not so good. As a result the terrific volume of heavy traffic, during the war period, has left these streets in deplorable shape. We have got to keep in mind likewise the anticipated increase in traffic.

It seems to me then that the duty of traffic engineers the country over is plain. If we are to cooperate with the Congress in bringing about a healthy reconversion; if we are to assist in the proper growth of industry and if we are to form the basis of a genuine prosperity, we must foster the idea of city streets first. Failure to do so may be disastrous.

Edgar H. Copell

Member, Board of Direction

A Promise and a Challenge

by H. S. FAIRBANK, *Deputy Commissioner*
Public Roads Administration

AT one time or another most of us have experienced a curious sensation of the vague familiarity of some place or circumstance in which consciously we have never been before. It is a rather common psychic phenomenon the explanation of which I do not know and have not troubled to find out. It has, I believe, nourished in some minds the superstition of a prior existence in which the subject experience, indubitably new in the present life, has been previously encountered.

A more plausible explanation might be that the sensation derives from a close similarity of the present place or circumstance with one which elsewhere and at another time has entered into our experience and our memory. In that way, at least, I am certain that I can explain my sense of familiarity with much that I observe in the present movement of events toward a new attack upon the highway problem of the cities.

Procession of Events

More than thirty years ago I witnessed as an interested observer a procession of events leading to what later matured in a remarkable improvement of the arterial highways of rural America. When I first knew these rural arterials they were still largely undistinguished by designation, improvement, or use from other roads comprising with them the existing inheritance of primitive country roads.

Still, like all other roads, they served mainly the transport necessities of very narrow localities. But already their native users had begun to remark the passage of an occasional stranger. And most of these strangers came from cities in new-fangled automobiles that frightened the natives' horses.

Already there was evidence that this new and growing traffic from the cities would eventually extend to a traffic between the cities; and in a very few states the emergence of a new class of arterial highways had been signalized by the designation of state highway systems.

Misapplication of Effort

The time I speak of is 1910. A round ten years was to elapse and much misapplication of road building effort by both the states and the Federal government was to occur before clear recognition of the need for arterial roads to serve arterial traffic was to culminate in designation of the Federal-aid highway system and state highways systems in all the states.

The policy then established of concentrated application of Federal and state resources to the development of an arterial system resulted, in little more than another ten years, in the creation of a system of main highways which, imperfect as we now know it to be, was yet at the time an object of world-wide admiration. In its inception, however, that very successful policy was a policy directed solely to the improvement of rural highways. The original Federal Act prohibited expenditure for highways penetrating beyond the fringes of the cities, and many of the state laws embodied a similar prohibition. The Federal prohibition was removed in the early thirties; but it was not immediately replaced by a positive plan of city arterial development.

This is an address by Mr. Fairbank given at a recent joint meeting of the Engineers Society of Milwaukee and the Wisconsin Section of the American Society of Civil Engineers.

The Federal and state programs continued largely rural in their application, but with increasing concentration upon the modernization of the roads earliest improved, which by the logic of original selection were often at the nearer approaches to the cities. In this more recent work there has been fortunate occasion to deal with conditions approximating those that must be confronted in the cities themselves, and these sub-urban undertakings have provided the testing grounds for many of the devices, designs, and procedures that will find beneficial application in future city projects.

Conditions In Cities

As now I observe conditions existing in the cities, and read the urban highway provisions of the Federal Aid Highway Act of 1944, it is the elemental similarity of those conditions and those provisions to the remembered conditions of rural roads in 1921 and the pregnant provisions of the original Federal Highway Act of that year that accounts for the sense that possesses me of events repeating themselves.

In 1921 the rural arterial highways of the country had yet to be clearly distinguished in the warp and woof of a rural road fabric largely local in its usage. Today the arterial highways of the cities are yet unclearly defined in the closer rectangular pattern of city neighborhood streets.

The earlier designation of rural arterials was followed by a sustained constructive effort which has progressively fitted these main rural highways to more efficient discharge of their distinctive arterial functions. So, we hope, will the similar designation of city trunk arteries be followed by a determined and continuing effort to give these important urban highways the physical form which will enable them, with far greater convenience than at present, to serve their particular purpose.

Vast Changes Certain

If our present hopes are realized then, in the next 25 years, we may expect to see as great a change in the face of American cities and the ways of urban living, as in a like past period we have seen in the American countryside and many of the conditions of rural life. And, as certainly as the experienced rural changes have been caused directly and indirectly by highway improvement, so will the yet-to-be-realized urban changes result from the direct and collateral effects of a new facility of movement afforded by the more efficient pattern and design of a modernized street system.

In the Federal Act of 1944 there is the same promise of the possibility of realizing these urban changes as in the Act of 1921 there was the beginning, and the promised means which, rightly used, have so powerfully contributed to the already realized rural changes.

Most significantly, for the cities to ponder, the Act authorizes the designation of an Interstate Highway System of 40,000 miles, to join the principal urban centers, and at these to include circumferential and distribution routes capable of conducting through traffic around, and terminal traffic intimately from and to various parts of the cities. Herein, lies the promise of Federal cooperation in the improvement of additional urban arterials; for all such designated circumferential and distribution routes, as well as the main routes of the Interstate system, are automatically to be added to the Federal-aid system, therein to be eligible for improvement with future appropriations for that system.

Vast Promises

These are the promises of the Act to the cities of the country: Of profound

significance in the designational provisions; of immediate consequence in the authorization of expenditure in three early years; of possibly vaster consequence in the implication of other expenditure authorization to follow over a long period, if the challenge of these premises is squarely met by the cities.

For this Act is a challenge as well as a promise to the governments and people of the cities of the country. Will they meet that challenge? Will they have the faith and the imagination to apprehend the ultimate potentiality of this Act? Will they have the wisdom so to use the means initially provided as to demonstrate that intention faithfully to employ the further means that may be provided, which alone will assure the continued provision?

The locational decisions may not be easy. The features of design, the standards of construction, essential to the creation of fully adequate urban expressways, will test your courage. You will need a daring beyond that necessary for the design and construction of arterial highways as they have been built in the past, in either the cities or the country.

Different Situation In Cities

The spatial environment and traffic volume of the average rural arterial highway is such as to permit service of both arterial and local traffic in the same traffic lanes. In the cities adequate accommodation of arterial traffic, elimination of the mutual interferences of arterial and local movement, and insulation of the heavy arterial traffic streams and bordering residential and business property each from the other, require the clear separation of arterial and local street facilities. The avoidance of frequent congesting stoppage of the arterial movement requires in the expressway design the elimination of all possible crossing at grade. All this adds up to expensive construction — to capital requirements of such large magnitude that it is easy to understand and sympathize with the frequent effort of city governments to find a solution in cheaper improvements.

The trouble is that for the larger cities there is usually no cheaper adequate solution. The alternative widening of surface streets, to mention only the most common resort of timidity, can never fully meet the need and may be far from inexpensive. A classic example of the mistake of this temporizing response is the Woodward Avenue widening completed in Detroit at great expense some years ago. The widened street has merely invited more traffic and compounded the congesting possibilities of its numerous grade intersections with cross streets. Profiting by the lesson learned from this early mistake, Detroit now plans to build intersection-free expressways to allow arterial traffic to move freely between the periphery and center of the city without interference from local traffic.

When such expressways or controlled-access highways are advocated as the most logical method of handling mass movements of traffic with a minimum of restriction, there is often an underlying fear that the expressways may be built in the wrong locations; that future growth and alteration of the city along lines not now anticipated, may render the new facilities of little value to the people and industries they were built to serve. This fear induces a desirable caution in decision.

A City Is Highly Complex

A city is a highly complex organism, not to be lightly tampered with. Changes of the street plan will inevitably affect many vital interests. Well conceived, the changes made will serve and can promote a generally beneficial urban development. Ill-planned, their direct and immediate

benefits may be swallowed up in generally detrimental effects and the positive thwarting of desirable city growth and change.

Many things other than the replanning of highway facilities must enter into the city planners' consideration—schools, housing, parks and recreational areas, rail terminals, airports, facilities of internal mass transportation—to name only the more obvious. The plans for all must be accommodated, each to the others.

Facing so complex a problem, the adequate solutions of which cannot be other than expensive, with prospects of financial support usually of the slenderest, it is not to be wondered that city planners and administrators have been baffled and hesitant. The principal root of their difficulty: Money. So little money, so much of need. This or that? Where is the money coming from?

Will Be Soundly Invested

To all such capital-questing city officials comes now the Federal government, in association with the governments of the states, offering capital aid for adequate improvement of arterial highways. It is inconceivable that the proffered aid will not be welcomed and soundly invested.

It is aid applied at a reasonable point of opening attack upon the complexities of the overall city-planning problem. Arterial highways, properly located and functionally adequate, must form the skeletal structure of any desirable city plan. The need of such a skeletal structure is beyond doubt. There may be question as to the desirable pattern of the structure and the location of its parts. There may be difference of view as to which of the several parts to build first.

These questions will be less difficult of answer, the differences of opinion less obstinate of accommodation, if certain facts and principles are kept in mind. All cities are alike in these respects: At the center there is a business or commercial area. From the periphery main highways, already established in arterial usage, radiate in the direction of neighboring cities. In the case of the larger cities a great part of the traffic found on these radiating highways near the city limits is bound to or from the city. At cities of over 300,000 population the proportion of this city-bound and city-originated traffic is usually 90 per cent or more of the total. Of this large fraction the origins and destinations in various proportions, are in different parts of the city; but those of a large proportion lie in the central business section.

Here, then, we have certain fixed points of any city arterial system—the business center, source and objective of a large part of the city's external traffic, and the points at which the main rural arterials enter the city's periphery.

Finger-Like Development

Beyond these peripheral points and along the radiating highways the city reaches out in finger-like development with generally undeveloped areas between the spreading fingers. This is the situation as we see it today.

At earlier stages of the city's growth there has been similar extension of development along these same radial lines. So that we are likely to find within the city, along the inward course of these same radial lines, the older and more compact residential developments and, usually, strings of business development.

Because of the traffic originated in, and destined to these more compact inner radiating zones, because this traffic in turn is directed in large part to and from the central business section, and because by historic habit

these same radiating lines have become the principal avenues of approach from contiguous city areas to the city center, the external traffic is compounded as it enters and leaves the city with a volume of local traffic increasing with nearness to the central area.

The City's Heart

This central area is the city's heart. It always has been. It always will be. It is now a heart congested by a traffic grown great with the greatness of the city—a traffic that daily flows in and out and through inadequate channels made less adequate by edging lines of parked vehicles and frequent stoppage of the flow at cross channels.

Around this heart area there is generally an enclosing layer of degenerate city tissue — a zone of more or less dilapidated buildings, usually old residences that have been converted to various commercial uses or allowed to deteriorate into sub-standard housing.

These are facts common to nearly all cities of considerable size and age. The existing facts themselves suggest the principles upon which a sound structure of new arterial highways may be patterned.

For Arterial Movement Only

Obviously there is need in the structure for lines joining the peripheral points of entrance of the external arteries with the city center. These lines should be developed as channels of arterial movement only — the external and the internal arterial movement. They should be freed of all local movement and stoppage. This will require usually the opening of wider and protected channels.

Wherever there is sound city tissue, whether of residential or commercial function, the opening of these new channels should avoid its eradication so far as possible. For this reason the new channels may not be cut exactly along the lines of the existing congested streets serving the arterial usage. Yet the new channels must serve the same arterial usage.

The city center to which these lines lead should be rid as much as possible of traffic merely passing through. Its streets should be rid of vehicles standing day-long in space needed for moving traffic and the delivery and loading and unloading of vehicles essential to the transaction of business. The new free-flowing arterials cannot deliver their faster-moving streams directly into the very center of this relatively small area without causing congestion.

The Arterial Belt

An arterial belt around the edges of the business section, at which the radial arterials would terminate and near which, in all parts of its circumference, would be the essential provisions for day-long parking of vehicles —such an inner belt highway would answer the needs that have been cited. It would conduct through traffic from one radial route to another, avoiding the necessity of passage through the business area. Its adjacent parking facilities, adjusted in location and capacity to determined needs, and sufficiently close to permit walking to all central destinations, would replace street space prohibited for parking use.

Receiving the concentrated traffic streams of the few radial arterials and filtering them to many orifices distributed around its circumference, such a belt highway would reduce the pressure and distribute the volume of traffic entering the central area and so minimize the possibility of congestion on the business streets.

Functionally similar to this inner belt highway, other belt routes may be described about annular zones within the city and about the city as a whole. The latter, in addition to its local distributive function, would also perform the special functions of a by-pass for the usually small fraction of through traffic.

What I have described may be considered an ideal pattern. It is, however, an ideal that fits the broad traffic facts of nearly every city. The task of the planner is to adapt the ideal to the conditions peculiar to the particular city. In his adaptation the ideal form, suggestive of the hub, spokes and rim of a wheel, will emerge in somewhat distorted form.

Inner Belt a Rectangle

The inner belt will usually be a rectangle. The spokes will be diverted from straight lines to connect subordinate business and industrial centers, to follow a natural depression affording favorable opportunity for separation of grades at cross streets, to obtain partial lateral protection by skirting a park, to avoid cutting through a residential neighborhood that should be kept intact. The outer circumferential route or routes may follow the generally rectangular city pattern or the freer directional lines of suburban roads; the rim of the wheel may be bulged and indented in places. The whole wheel pattern may be chopped off at one side by a large body of water as in Milwaukee. The general pattern will be apparent nevertheless.

The development of truly free-flowing arterial highways along the chosen lines will require, eventually if not immediately, the elimination of grade intersection with crossing streets.

The expressway type that has proved most desirable in developed urban areas is that in which the express lanes are built at or below the general level of the surrounding area, with no direct access from abutting property and no crossings at grade. Such a highway requires a right of way of width approximating the length of the usual city block. Where the line of the expressway generally parallels one direction of a typical grid pattern of city streets, it is preferable to acquire the right of way between streets rather than to widen one street. Such a plan will possibly permit retention of the adjacent streets as the parallel local ways needed in conjunction with all city expressways. It also avoids some costly revision of underground facilities.

Elevated Type Costly

The elevated type of expressway is costly in construction. The prevailing impression that it is sparing of right-of-way cost, particularly that it can be located on existing streets without acquisition of additional right of way is seldom correct. An elevated structure can be built in a right of way barely wide enough to accommodate the structure itself, but this is rarely desirable. The street in which the structure is built must usually continue to serve the local traffic of abutting property. The columns necessary to support the elevated structure will seriously impair the usefulness of the street in this respect. The structure itself will block off light, and seriously damage property on both sides. It should be realized that where elevated structures can be justified the expected traffic volume will usually be great enough to require a four or six-lane facility, and a structure width nearly that of the average city street; and additional space is required at intervals to provide for essential ramps. If right of way of sufficient width to avoid these disadvantages is obtained, the width may be substantially that required for a depressed expressway. The two principal advantages of the elevated type are that (1) nearly all cross streets can be carried under it, and (2) all underground and almost all other utilities can be left practically undisturbed. A further very serious disadvantage of even the well designed elevated highway is that it does not lend itself to stage construction.

This is a serious disadvantage, because a complete system of free-flow-

ing arterial highways cannot be built overnight or even, perhaps, in a few years. The depressed type of expressway lends itself more easily to development in progressive stages. As soon as the lines of a route are determined it would be possible, for example, to develop the bordering local ways of the eventual expressway and use them as one-way streets with crossings at grades, even before acquiring all of the property between them. The right of way acquired and buildings razed, ground-level express lanes can be constructed between the local ways, with few or none of the street crossings separated in grade. In subsequent stages the original ground-level grade of the express lanes can be rolled under additional crossing bridges to be constructed, until the full development of an intersection-free facility is achieved.

A Heartening Promise

The possibility of eventual development of complete systems of such free-flowing expressways, properly integrated into the general city plan, is the heartening promise of the Federal Aid Highway Act of 1944 to the cities of the country. Nothing less will afford the needed relief from the ills of traffic congestion from which we for a brief period have had only partial relief—and which are now certain to return in aggravated intensity.

The new Federal Act points the way to—yes, it actually requires — the taking of certain necessary basic decisions by the cities and the states. It provides a beginning, and implies a continuance of Federal aid at every step of the way to the ultimate goal —in the planning of the system and the design of its elements, in the acquisition of rights of way, and in the construction of the facilities.

Will the cities, reading aright the great significance of this Act, have the vision and the will to meet the Federal promise with the essential responsive measures demanded of them? That is the challenge of the Act to the cities of the United States.

"TRAFFIC MASTER" BEING INSTALLED IN DETROIT

The General Electric traffic signal control device known as the "Traffic Master" or "mechanical brain" is being installed in the city of Detroit to control several miles of Grand River Avenue—a street averaging 40,000 vehicles a day with 2,000 in one direction at peak hours.

The new "mechanical brain" which controls city traffic lights provides automatic timing changes in a system as often as every 12 minutes during a day under six different programs. The device, developed in the company's Lighting Division in Schenectady, permits variations in signal timing as far in advance as 12 weeks, taking into account variations resulting from holidays or special events, such as football games and parades.

A weekly program cylinder permits any one of six programs to be selected for any day of the week.

Pedestrians also get a break from the "mechanical brain." The pedestrian "walk" indication can be lengthened or shortened to the direction of heaviest traffic flow in the same manner as automobile control.

★ ★ ★

DRIVE CAREFULLY!

A shave while you are alive costs 35c. It costs $5.00 to shave you after you are dead. A woolen overcoat costs, say $50.00. A wooden one $500.00. A round trip taxi fare to a theatre costs $1.00, but a one way ride to a cemetery costs $10.00.—*The Wheatley Pumper.*

U. S. Senate Gives Go Sign To $3 Billion Road Program

PASSAGE by the Senate Oct. 2, 1945, of House Concurrent Resolution 81 gave the green light to highway construction. The measure, which makes immediately operative the provisions of the Federal-Aid Highway Act of 1944, authorizes the expenditure of $500,000,000 for the fiscal year 1945-46. A like amount is also made available for the next two succeeding fiscal years. With state matching funds this makes a total of $3,000,000,000.

The passage of this resolution together with the recent release of unobligated balances of federal-aid funds by the President and the lifting of all controls and restrictions on highway construction by the WPB, now makes it possible to launch the largest highway program in the history of the nation.

The freeing of these funds, together with other funds on hand, makes possible an approximate program for the calendar year 1946 as follows:

Unobligated balances	$106,000,000
State matching funds	106,000,000
Federal-aid, fiscal year 1945-46	500,000,000
State matching funds	500,000,000
Federal-aid, fiscal year 1946-47	500,000,000
State matching funds	500,000,000
	$2,212,000,000

In addition, approximately $115,500,000 of federal funds will be available during the fiscal years 1945-46 and 1946-47 for the construction of public land roads.

To briefly summarize, the highlights of the Federal-Aid Highway Act of 1944 are as follows:

1. Authorizes the appropriation of $500,000,000 for each of the three successive postwar years.

2. Divides annual authorizations in the following manner: (a) $225,000,000 for projects on the Federal-aid system; (b) $150,000,000 for projects on the principal secondary and farm-to-market routes; (c) $125,000,000 for projects on the Federal-aid system in urban areas.

3. Apportions funds among the states on the following basis: (a) Federal-aid system, 1/3 area, 1/3 population, and 1/3 road mileage; (b) Secondary system, 1/3 area, 1/3 rural population and 1/3 mileage of rural delivery and star routes; (c) Urban highways in the ratio which the population of municipalities of 5,000 or more in each state bears to the total of such population in all the states.

4. Funds are available for one year after the fiscal year for which they are apportioned, after which time they lapse.

5. Construction costs are on a 50-50 matching basis.

6. Right-of-way costs allowed up to one-third of total cost.

7. Entire construction cost of grade crossing projects paid from federal funds, also 50 per cent of right-of-way costs.

8. Standardization of signs and markings.

It is significant to note that the postwar highway program is the first large public works program to get under way. Other public works programs are to a large degree still in the development stage and many policies must be crystallized before they can become an actuality. It is, therefore, evident that the highway construction industry faces a tremendous responsibility in filling the gap which will occur in other industries during the reconversion period.

—*A. R. B. A. Legislative Lookout.*

Design Standards Established For National Highway System

Technical Editor's Note: On the eve of one of the great eras in highway construction, the American Association of State Highway Officials has prepared a set of design standards for use on the national system of interstate highways which at this writing is being selected by the 48 state highway departments. The new national system will include heavily travelled routes in all sections of the country and, for the first time, will extend into and through urban areas, permitting the expenditure of Federal funds for the relief of city street congestion. Since the network is to be thus limited to the more important traffic-ways, the standards conceived for its design are correspondingly more refined than those employed on the typical major highways of the immediate pre-war period.

The text of the standards, reproduced below as Part A, have been accepted by the Public Roads Administration for application on interstate system improvements. Highway and traffic engineers alike will watch with much interest the effect of these superior standards on the future highway tranportation scene.

Design standards have also been adopted by the Association for use on secondary and feeder roads. These are given as Part B.

PART A

DESIGN STANDARDS FOR THE NATIONAL SYSTEM OF INTERSTATE HIGHWAYS

OF THE

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS

ADOPTED AUGUST 1, 1945

IN GENERAL the basic standards of road and structural design in the report of the National Interregional Highway Committee are recognized as embodying the elements of design to produce the highway facilities that now appear, as a long-range plan, necessary for the limited mileage of highways to be designated as the National System of Interstate Highways.

The following design standards are recommended for use in the design of projects on the National System of Interstate Highways. Some of these standards necessarily are shown as minimum values. It is recognized that many states are now well along in the preparation of plans and it is recommended that changes in these plans be not required where they do not wholly meet the following standards.

Long Range Standards

Definition—The desirable design standards for projects on the National System of Interstate Highways are the set of values or controls, the use of which is intended to produce highway facilities that represent the best practice in the light of present knowledge. These are long-range standards for the future and it is recognized that, for the interim period, stage construction may be permitted and that, for certain conditions, it may be necessary to utilize values lower than the minimum standards suggested.

Traffic Bases—References to traffic warrants in these standards are made in terms of peak-hour traffic determined as a basis for design. As discussed in "A Policy on Grade Separations for Intersecting Highways" (pages 16 to 18)it is now deemed advisable that design be made to accommodate the 30th highest hourly traffic density of the year.

The Interstate Highway System shall provide or allow for the subsequent provision of facilities capable of serving safely and efficiently a mixed traffic of passenger automobiles, motorbusses, and motortrucks and tractor-trailer and semitrailer combinations of a volume of each of the constituent elements estimated to be

that which will exist 20 years from the date of construction.

Control of Access

Control of Access—Controlled access for highways shall be defined to mean the permission of access to and from adjacent property at certain locations and for certain purposes and the permission of interchange with selected intersecting streets and roads.

Where state laws permit, control of access shall be obtained on all new locations and on all old locations wherever economically possible. A design with frontage roads may be used for this purpose. In those states which do not have legal permission to acquire control of access, additional right-of-way should be obtained adequate for the building of frontage roads connecting with controlled access points, if and when necessary.

Railroad Crossings—Where railway operation involves two or more main-line tracks, separation should be provided regardless of traffic volumes on the interstate highway.

Where the railway operates six or more regular train movements per day on a single track, separation of grades may be justified regardless of traffic volumes on the interstate highway.

Where the railway has five or less regular train movements per day, grades should be separated when an economic analysis indicates justification, proper weight being given to both hazard and delay.

Where grades are not separated, provision shall be made for installation and operation of adequate protective devices.

Crossroads—For a design traffic density of 3,000 or more on an interstate highway, every effort shall be made to eliminate all cross traffic at grade.

For lower traffic density on the interstate highways, cross traffic at grade shall be eliminated where justified on the basis of an economic analysis giving proper weight to traffic delay, traffic hazard, and convenience.

In all cases where it is reasonable to believe that future elimination of cross traffic at grade may be justified, sufficient right-of-way should be provided for the ultimate design.

Where cross traffic at grade is not eliminated, traffic signal control installations, channelized intersections, or stop control on the crossroads shall be provided.

Design Speed—

	Miles per hour	
Rural sections:	*Minimum*	*Desirable*
Flat topography	60	70
Rolling topography	50	60
Mountainous topography	40	50
Urban sections	40	50

Alinement Control—All curves sharper than 1° shall be super-elevated.

All curves sharper than 2° shall be designed with approach transition curves. The following maximum curvatures shall be used as consistent with design speeds:

Design speed	*Degree of curvature*	
(m.p.h.):	*Maximum*	*Desirable*
70	4	3
60	6	5
50	9	7
40	14	11

Sight Distance—Sight distance commensurate with the type of highway and the design speed shall be provided as shown in "A Policy on Sight Distance for Highways."

On two-lane roads, sections with sufficient sight distance for safe passing should be frequent enough to serve the intended purpose. Cost and topography must be analyzed jointly with the expected traffic volumes and likely speeds of vehicles in the design of safe passing sections. Where it is not practicable to provide frequent passing sections, consideration should be given to the provision of a four-lane highway instead.

Gradients—The maximum gradients preferably shall not exceed 5 percent

and in any case shall not exceed 6 percent. On short lengths only, gradients of 7 percent may be used.

Pavement Widths—Where the traffic density per lane is less than 200 the surfacing or pavement shall be designed for 11-foot lanes.

Where the traffic density is 200 or over, the surfacing or pavement shall be designed for 12-foot lanes.

In urban areas all surfacing or pavement shall be designed for 12-foot lanes.

Divided Highways—Where the traffic density at present or anticipated upon completion of an improvement is 500 or more, the initial improvement should be patterned to the ultimate highway development and provision shall be made for acquisition of the necessary right-of-way. Where the traffic density is 800 or more, a divided highway facility shall be constructed.

The width of median strip shall be as follows:

	Width in feet	
	Minimum	*Desirable*
Rural	15	40
Urban	4	12

Under special conditions where economic considerations govern, a median width of 2 feet may be used, recognizing a 4-foot width as desirable even under these conditions.

Curbs or other devices may be used where necessary to prevent traffic from crossing the median strip.

Three-lane Highways—Where the traffic density is intermediate between that for a two-lane highway and that for a divided highway, a three-lane highway may be used for the conditions described in "A Policy on Highway Types" (p. 66).

Shoulders—Except in mountainous topography shoulders shall be provided clear of the road surfacing or pavement for a minimum width of 10 feet, measured to the intersection of the shoulder and side slope planes. Such shoulders shall provide adequate support for standing or disabled vehicles. In mountainous topography an effective shoulder width of at least 4 feet shall be provided.

Slopes—The side slopes shall not be steeper than 2:1 in cuts except in solid rock or other special soils and on fills except of rock or other special materials that may justify steeper slopes. On fills of 10 feet or less in height the side slope shall not be steeper than 4:1.

Right-of-way—The right-of-way for rural highways of the following widths shall be either purchased or placed under public control through easement or other means:

	Width in feet	
	Minimum	*Desirable*
Two-lane highways	120	220
Divided highways	150	250

On urban sections of the system specific right-of-way widths are not recommended because of the widely variable conditions but provision should be made for the acquisition of sufficient right-of-way for the ultimate design.

Culverts—The clear width of all culverts, generally defined as structures of a length between abutments of 20 feet or less, shall be sufficient to carry the pavements, median strip, and shoulders across without reduction and, as necessary, the continued slopes outside the shoulders.

Bridges—All bridges shall be located to fit the over-all alinement and profile.

All structures shall be of steel, reinforced concrete or masonry construction and designed for the H 20-S 16 design load (A.A.S.H.O.).

All structures preferably shall be of deck construction.

The clear height of all structures shall be at least 14 feet over the entire width of traffic lanes and at least 12½ feet over the effective shoulder width.

The width of all bridges of a length between abutments of 80 feet or less shall equal the full roadway width including the effective width of shoulders.

On all bridges where the length between abutments is more than 80 feet the width between the edge of surfacing or pavement and the face of curb preferably should be 3 feet and in all cases at least 2 feet. The face of rail preferably should be 4½ feet and in all cases at least 3½ feet outside the edge of surfacing or pavement.

Sidewalks or safety walks shall be included on structures wherever the pedestrian traffic justifies.

The lateral clearance from the right edge of pavement of the through traffic lanes to the face of walls or to abutments and piers at underpasses shall be at least 6 feet.

The lateral clearance between the left edge of the pavement and the face of a center pier or abutment shall be at least 4½ feet.

A. A. S. H. O. Design Policies—It is recommended that where they do not conflict with the above standards, the practices and values of the seven A. A. S. H. O. design policies now approved and published be used in the design of highways on the Interstate System.

PART B

DESIGN STANDARDS FOR CONSTRUCTION AND RECONSTRUCTION OF SECONDARY AND FEEDER ROADS

OF THE

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS

ADOPTED AUGUST 1, 1945

Definition—Design standards for

MINIMUM DESIGN STANDARDS

	Annual average daily traffic volume—					
	Under 100		100 to 400		400 to 1,000	
	Minimum	Desirable	Minimum	Desirable	Minimum	Desirable
Design speed (miles per hour):						
Flat topography	40	——	45	55	50	60
Rolling topography	30	——	35	45	40	50
Mountainous topography	20	——	25	35	30	40
Sharpest curve (degrees):						
Flat topography	14	——	11	7	9	6
Rolling topography	25	——	18	11	14	9
Mountainous topography	56	——	36	18	25	14
Maximum gradient (percent):						
Flat topography	8	5	8	5	7	5
Rolling topography	12	7	10	7	8	6
Mountainous topography	15	10	12	9	10	7
Non-passing sight distance (feet): [1]						
Flat topography	——	——	315	415	350	475
Rolling topography	——	——	240	315	275	350
Mountainous topography	——	——	165	240	200	275
Width of surfacing or pavement (feet)	12, if any	——	16	20	18	20
Width of roadbed (feet)	20	——	24	28	26	30
New bridges:						
Clear width (feet)	14	20	22	24	[2] 24	——
Design load, A. A. S. H. O.	H–10	H–15	H–15	——	H–15	——
Bridges to remain:						
Clear width (feet)	——	——	15	——	18	——
Safe load, posting basis (tons)	——	——	6	——	10	——
Width of right-of-way (feet)	[3] 40	——	[3] 40	80	50	80

[1] As defined in "A Policy on Sight Distance for Highways."
[2] Minimum of 24 feet or 4 feet more than approach pavement width.
[3] Minimum of 40 feet or as required for construction.

secondary and feeder roads are the set of values or controls to be used for minimum design, but not necessarily for exceptional cases for which values will need to be determined separately. However, the standard design values or controls should be recognized as "near-minimum" rather than "desirable" values.

Traffic Basis — These standards are shown for three ranges in volumes of annual average daily traffic. These volumes are assumed to be the present traffic or that estimated to occur when the improvement is completed. It is desirable that these standards be used for volumes which allow for future increases in traffic. The design peak hour traffic density is assumed to be approximately 10 percent of the annual average daily traffic.

These design standards are for roads with annual average daily traffic up to 1,000 vehicles. Roads with greater volumes should be designed in accordance with current practice applicable to roads with similar conditions on the Federal-aid highway system.

FEDERAL-STATE-LOCAL COOPERATION RESULTS IN PLANS FOR HIGHWAYS THROUGH 16 TEXAS CITIES

Cooperation between city and county governments, the urban planning division of the Texas Highway department and the Public Roads Administration resulted recently in completed plans for highway routes through 16 cities in Texas, the International City Managers' Association reports.

The cities are Austin, Beaumont, Corpus Christi, Del Rio, Denton, El Paso, Fort Worth, Gainsville, Greenville, Houston, Lubbock, Orange, Paris, Port Arthur, San Antonio and Tyler.

Construction plans are now under way in eight of these cities under the federal-state-local plan as provided in the Federal Highway act of 1944.

Five principles were followed by the state highway department in planning routes through cities:

1. To avoid traversing a critical zone.
2. To avoid schools and churches.
3. To find a route through the least expensive property to the fringe of the heart of the city.
4. To find the route best adapted to aid in the uniform development of the city by compactness of expansion rather than the "string" type of development prevalent in the past.
5. To aid traffic by indicating where traffic should go.

Each city started plans for the highways by analyzing information supplied by municipal officials on retail, wholesale, and industrial areas; residential zones by house and lot valuation; apartment districts; and all physical plants such as schools, parks, playgrounds, institutions and churches. Traffic data was also secured.

Preliminary plans for routes were then prepared and meetings were held with planning boards and with city and county officials. Municipal officials contributed suggestions to a preliminary plan for routes which were reviewed by the director of urban planning of the state highway department and then submitted to the state highway engineer.

After the plans were approved the report was printed and copies were sent to city and county officials and to the Federal Roads Administration.

When the final report was approved and published, municipal officials met with the highway department to select projects by number and order of importance, to make commitments on funds available by the city and the state, and to make a recommendation to the highway commission which in turn makes the final decisions.

COMBINES ALL the Economy Factors and Lights All Kinds of Streets

THE LONG-LIVED FORM 79 LUMINAIRE meets the various illumination needs of all your streets. It conforms to your standard installation practices. It is adaptable to your normal maintenance procedure. And—it accomplishes all these things in a single, basic, low-cost design.

LESS BREAKAGE

Breakage, as well as light loss from dirt accumulation, is reduced because the reflector and globe are spun-sealed together into a single unit. A gasketless, pressure seal joins the reflector and hood.

VARIETY OF LIGHT DISTRIBUTIONS

With the choice of four types of light control, you can have a safe level of light on streets of any type and width, at spacings that afford savings in equipment investment.

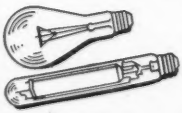
ANY POWER SUPPLY

The Form 79 is available with sockets for multiple, straight-series, or series-with-insulating-transformer operation. All are properly and rigidly mounted to assure the correct and permanent focus of the lamp in its reflector.

EASY RELAMPING

To reach the lamp, just unlatch the spun-sealed reflector from the hood. A sturdy chain suspends the reflector from the hood during servicing. For inaccessible spots, two alternate types of detachable globe holders can be used.

CHOICE OF LIGHT SOURCE



Form 79 is not limited to regular tungsten-filament lamps. If you want the economy plus the attractive color of long-life Mazda-H mercury lamps (either 250 or 400 watt) the Form 79 is equally applicable.

APPLICATION AID

G-E specialists are at your service if you need help in selecting the right Form 79 for your needs. Bulletin GEA-2276E, just off the press, is packed with answers to your questions about this luminaire. Ask your G-E office or write Apparatus Dept., General Electric Co., Schenectady 5, N. Y.

GLOBE REPLACEMENT. Our exchange plan for damaged units provides fully reconditioned and modernized reflectors as well as new glassware, for little more than the cost of glassware alone.

GENERAL ELECTRIC

NOVALUX FORM 79

452-35D-3010

Is The Downtown Shopping Area Doomed?

by JOHN A. MILLER, *Transportation Consultant*

Reprinted from The Bulletin of the National Retail Dry Goods Association

TOMORROW the downtown districts of the cities of the United States may be studded with the abandoned remains of once imposing buildings, as are the cities of Europe today—not because of war, but because of the unchecked spread of decentralization. This process of decentralization began as a movement of city dwellers to the suburbs in search of better living conditions. It was made possible by the automobile, which provided q u ic k and convenient transportation from suburban homes to stores, offices and other establishments in the central business district. The plan worked well enough as long as it was followed only by a small proportion of the city's population. When too many people tried to follow it, the plan began to bog down. Congestion in the streets leading to the central business district, and the difficulties of parking automobiles there led to the migration of business to outlying districts.

Slowly But Steadily

In most cities the decentralization of business was proceeding slowly but steadily until the outbreak of the war. The larger New York stores had established branches in suburban towns in New Jersey, Westchester and Long Island. At Philadelphia an important business center had grown up at 69th street. Chicago stores were establishing suburban branches. In Los Angeles a very imposing shopping district had come into being on Wilshire Boulevard at a considerable distance from the center of the city. Elsewhere the story was the same.

During the war this trend was halted for the time being. What will happen now is a question that vitally concerns every store owner and business man in the downtown sections of our cities. Will decentralization continue until the central business district virtually disappears? Or will corrective measures be taken to reverse the prewar trend?

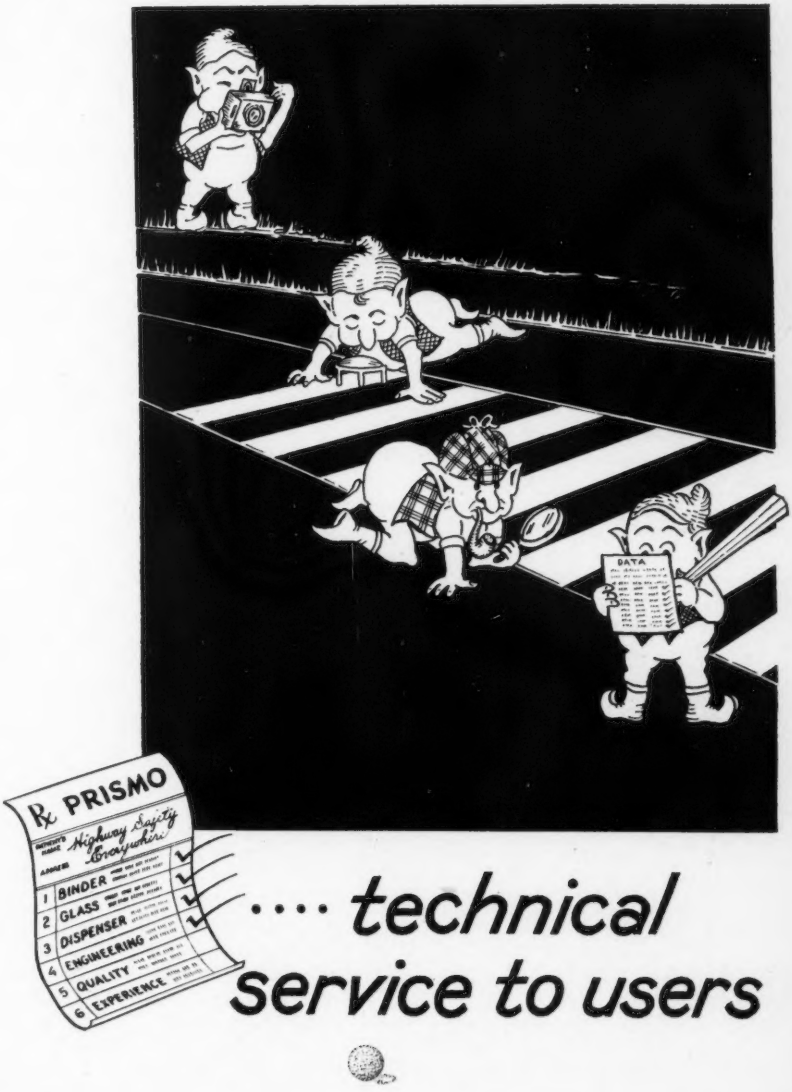
The question is almost wholly one of transportation. The future of the downtown districts depends on easy accessibility. If that is provided, the central business area will live and prosper. Otherwise it will dry up and die. It will become a mere ghost of its former self.

Inadequate Consideration

Everybody agrees on the need for fast and convenient local transportation, but there is a great deal of misunderstanding about ways to provide it. Far too much emphasis is placed on building new super-highways without adequate consideration of the limited capacity of such structures when used by private automobiles. These superhighway plans are widely advocated on the ground that they will give access to the centers of cities, and will thus help to maintain property values and to remedy congestion and blight. But the provision of such highway facilities is extremely expensive.

To solve the urban transportation problem by means of express highways would require an enormous mileage of new construction. At a cost as low as $2,000,000 per mile, the total expenditure would be staggering. This is brought out clearly in the recent report of the Metropolitan Transit Com-

PRISMO "LIFELINE"



.... technical service to users

THE PRISMO SAFETY CORPORATION

HUNTINGDON · · · · · · PENNSYLVANIA

mission of the Massachusetts Legislature which points out that its proposed plan of improved electric rapid transit lines, trolley coaches and motor buses would accommodate 2,000,000 persons a day at an expenditure of $46,000,000 for construction and equipment, "or a cost comparable to that for one multiple-deck or superhighway through Boston." At least ten superhighways would be required to accommodate the same number of people.

Then too, there is the terminal question. What to do with the tidal wave of private automobiles after they arrive at their destinations is as great a problem as to provide roadways on which they can operate.

Principally An Inconvenience

Street parking inconveniences many times more people than it accommodates. For example, the two curb lines of a 500-ft. city block provide space for not more than 50 vehicles, allowing 20 feet for each one. If the street is of average width and moderately busy, at least 1,000 vehicles will pass through the block in an hour's time, all forced to move in the two center lanes because the two lanes nearest the curbs are being used for storage instead of movement. Thus there will be twenty vehicles inconvenienced for every one accommodated.

Underground parking has been tried in a few instances. Notable among them is the four-level garage under Union Square Park in San Francisco. Built at a cost of 1½ million dollars, it will accommodate 1,700 automobiles. Charges are 25 cents an hour, 75 cents overnight and $12.50 per month.

Favorable opportunities for such undertakings are scarce. Investigation has disclosed that the average motorist is not willing to walk more than five blocks between the place where he leaves his auto and his ultimate destination. Few, if any, cities have parks sufficient in number and so situated as to permit the construction of adequate underground garages in the locations where they are needed. Moreover, a parking fee of 25 cents an hour is greater than the average motorist wants to pay.

Off-street Parking a Makeshift

Off-street parking in vacant lots is only a make-shift, and offers no real solution of the problem. The amount of vacant land available for such use is sufficient to accommodate but a relatively small number of automobiles. Parking in commercial garages is sound enough in theory but is of doubtful practicability because of the lack of an adequate number of such garages. In either case the fee charged adds considerably to the cost of the motorist's trip.

Department stores have, in some instances, undertaken to provide off-street parking facilities for some of their customers. This arrangement is convenient for the customer, but rather expensive for the store. If it were possible to provide free parking for all of the customers, the cost would be prohibitive.

The crux of the parking problem is that the ground space required to park an auto is as great, or greater than the ground space required for the activities of the persons it transports. A one-story factory covering an acre of ground needs an acre of parking space nearby if all employees come to work by private automobile. Department stores, however, require three to four times as much space for parking as for retail activities. A four-story department store needs a twelve-story garage for its customers. On this basis more than half the ground area of our business and industrial districts would be devoted to automobile parking. The expense of such a program might well prove as great as that of constructing elaborate superhighway systems.

From all this it is evident that the idea of a postwar transportation para-

dise with everyone traveling by private automobile is only a dream. The result would not be transportation paradise. It would be transportation chaos. Cities must continue to depend on good public transportation service just as they have in the past.

This does not mean, however, that they must depend on the same kind of public transportation as they have had in the past. Modernization of local transit lines is needed everywhere. These lines have performed magnificent service during the war, but much of the equipment was relatively old before the war, and it has had hard usage during the past three years. A large number of new vehicles will be needed to put the operating companies in a position to handle their postwar business satisfactorily.

A few of the larger cities such as Detroit, Cleveland and Boston, are planning on the construction of new rapid transit lines. For most cities, however, the chief reliance will be on surface lines operated by street cars, electric trolley coaches, or motor buses.

Streetcar for Heavy Traffic

Despite the widely held idea that the street car is obsolete, its use will probably be continued on traffic lines that are heavy. Transit officials point out that the industry's 27,000 street cars are carrying as many passengers today as its 48,000 motor buses. They believe that the large carrying capacity of the street car gives it definite advantage on heavy traffic routes in large and medium cities.

Important improvements in street car design have been worked out during the past year. The oustanding features of rubber-cushioned wheels, smooth and rapid starting and stopping, and quiet operation, which have made the so-called President's Conference Committee type of car extremely popular with the riding public, have all been retained. Electric braking, however, has now entirely replaced air braking and improvements have also been made in window arrangement and ventilation. It is anticipated that the transit industry will purchase a considerable number of these improved cars during the next several years.

Extensive substitutions of rubber-tired vehicles in place of rail cars may be anticipated in cities of medium and small size. The popularity of new trolley coach lines which have been established in recent years affords reason to believe that this type of vehicle will be selected for a large part of the conversion. Polls taken of transit riders in various cities have indicated that the trolley coach is the best liked of all transit vehicles on account of its quiet, rapid operation and its curb loading. Statistics show that trolley coach riding throughout the country has increased 232 per cent since 1940, while transit riding as a whole has increased only 77 per cent.

Trolley Coach Expansion

Plans are under way for expansion of trolley coach operation in a number of important cities. These include Akron, Atlanta, Boston, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Indianapolis, Providence, San Francisco and Youngstown. In some instances the trolley coaches will be substituted for rail cars. In other instances they will replace motor buses.

Many new motor buses will also be needed for the modernization of transit service. Experience has shown that they can be most effective on lines where riding is relatively light, or in express service.

Provision of adequate transportation facilities, both public and private, is one of the most important aspects of postwar city planning. To no one is it more important than to the retail merchant. His customers depend upon transportation to reach his store, and it is directly to his interest that transportation planning be wisely done.

THIS IS WHY Scotchlite

REG. U.S. PAT. OFF.

VISIBLE AT GREATER DISTANCES

OVERALL REFLECTORIZATI
THAT RETAINS BOTH
SHAPE AND COLOR

SCOTCHLITE MAY BE APPLIED

AVAILABLE IN COLORS OF
SILVER • YELLOW • WHITE • RED

MINNESOTA MINING & MANUFACTURIN
900 Fauquier Avenue, Saint Paul 6, Minnesota

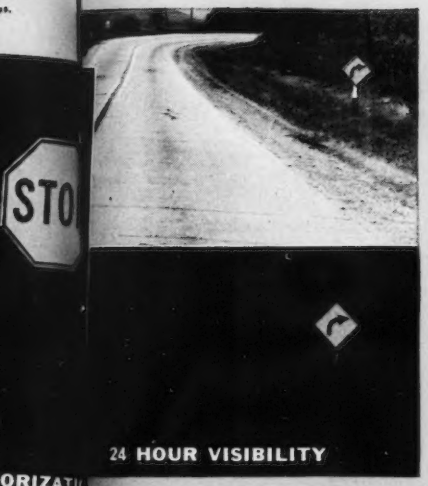
Please Send me your New "SCOTCHLITE" SI

Name _____

Address _____

City _____ Zone _____

IS BETTER



The advantages of reflectorizing traffic signs with "SCOTCHLITE" are unequaled in the promotion of safety.

"SCOTCHLITE" overall reflectorizing retains both shape and color for easy identification day or night, and gives far greater legibility. It is a proven product that has withstood years of continuous weather testing under all kinds of climatic conditions.

Available in roll form, it is not limited in its use. *Every* type of sign can be reflectorized regardless of design. "SCOTCHLITE" is simple to apply and easy to handle. New signs or those already in use can be converted to "SCOTCHLITE."

Motorists today and in the future will depend on these reflectorized traffic signs that give adequate warning.

You can purchase "SCOTCHLITE" in roll form or in completely made-up standard signs ready to install.

NY TYPE SIGN

MANUFACTURED IN ROLL FORM OR IN MADE UP SIGNS

ITE NEWS AND PERSONALS

Washington Section Has Dinner Meeting

The Washington Section held a dinner meeting October 24, 1945, attended by 21 persons. Several of the Section's members, who attended the Annual Business Meeting of the Institute recently in Philadelphia, discussed informally the highlights of the meeting.

Both the committee on the Five-Year Post-War Traffic Plan for Washington, Earl Allgaier, chairman, and the committee on the Transportation Plan for the Metropolitan Area of Washington, C. G. Stoneburner, chairman, indicated their reports were in process of final typing, preparatory to being sent to the Commissioners of the District of Columbia.

Present at the meeting were: Earl Allgaier, L. A. Andriacchi, W. F. Boardman, W. L. Braun, W. W. Davis, J. B. Ecker, W. G. Eliot, 3d, H. F. Hammond, E. H. Holmes, Martin Klein, Harry Koch, D. W. Loutzenheiser, B. W. Marsh, J. H. Mitton, O. K. Normann, P. L. Ristroph, W. L. Robinson, M. C. Stark, C. G. Stoneburner, P J. Stupka and P. E. Taylor.

The next meeting of the Section is scheduled for December 5.

New York Section Holds First Fall Meeting

The New York Metropolitan Section, I.T.E., held its first Fall meeting on Monday, Oct. 29, at the Town Hall Club in New York. After an enjoyable dinner, Section President Ted Matson welcomed Ed Wetzel, recently returned from the Army and overseas, and Mr. Martin, a guest from the Automatic Signal Corporation. The business meeting which followed was devoted largely to laying plans for future Section meetings and activities.

Subsequent meetings are to be devoted to guided discussions on pertinent and timely issues with which the traffic engineer has to deal. Topics for discussion are to be chosen in advance of each meeting and a chairman to preside over each discussion is to be chosen in advance by the group. The subject for the next meeting, to be held early in December, is "Parking versus Congestion," with particular emphasis on conditions along major routes leading into medium sized cities and towns. Other subjects for subsequent discussion will be: Professional Engineering Licensing, New York City Traffic, and Signal Application and Standardization.

A social meeting to which the ladies are to be invited was also favorably discussed. The meeting adjourned at about 10:15 after the showing of the Portland Cement Association film "Limited Ways."

Those in attendance were: E. H. Clark, E. H. Eames, Bruce Greenshields, Herbert Keegan, Ted Matson, Reiner J. Martin, Virden Rittgers, R. W. Siver, S. Herbert Taylor, and Ed Wetzel.

PERSONALS

Russ Harrison (Assoc.) writes to I.T.E. Headquarters as follows:

"Your very kind letter of July 11 arrived just before I left Marseille on a 10-day road trip. Ross Shoaf (Assoc.) certainly did a grand job as my press agent. Really, I was as proud to see General Philip's letter published in TRAFFIC ENGINEERING as I was to receive it.

SUPER ELECTRO-MATIC

Moves

HEAVY POST-WAR TRAFFIC

MAXIMUM

EFFICIENCY

MODEL 1022 DISPATCHER

- Responsive to fluctuating traffic density, volume, and speed.
- Flexible and continuous traffic-adjustment of intervals.
- Automatic coordinated operation.

"Traffic Regulation With Intelligence"

AUTOMATIC SIGNAL CORPORATION

NORWALK, CONN. ARMY E NAVY CHICAGO, ILL.

When writing to advertisers, please mention TRAFFIC ENGINEERING

"Last July 20th, Ross and Neil McCandliss (Assoc.) gave me a lift in their jeep to Paris after a two-day visit on their part in LeHavre. We left Jim Murphy to "Hold the Port" (pardon the pun). Jim, however, was to follow me into Paris less than a month later.

"Both Murphy and I were to leave the Transp. Corps for duty with the Theatre Provost Marshal. Jim has gone into Germany. On July 26, accompanied by Ralph Gross (Assoc.), I arrived in Marseille. Ralph left me three or four days later to go to Berlin.

"Fortunately, I was not left alone in Marseille—truly the melting pot of the world. Paul Robinette (Assoc.) was here with the Transp. Corps. For better than two months now, Paul and I have worked together very closely on traffic problems in Marseille and Delta Base Section. It has been a real pleasure working with Paul. He has been doing an outstanding job in this Section since last February.

"My year of overseas service is nearly completed, and if luck holds, I should be home for Thanksgiving Day. You can imagine how anxious I am to return to Marie, Greg and Ann.

"A suggestion—the overseas Traffic Engineers could put on a wonderful skit at the ITE Banter Breakfast next year."

Capt. S. E. Butterfield (Assoc.) also wrote to I.T.E. Headquarters under date of Sept. 8:

"Not much news to report from this side. I am down here at the Army Forward Headquarters working on the scheduling by highway of the movements of all units leaving Third Army area. Not very exciting work compared to activities during the campaigns, but there is some consolation in the knowledge that we are helping to get the boys home. When my turn will come I don't know, perhaps not for several months.

"Bud Yost (Affil.) was telling me that he recently had had a phone call from Bob Swain (Assoc.), who apparently is assisting with the clearing of some of the river channels up north of destroyed bridges and other obstructions. Bob is some two or three hundred miles away, but he hoped that he might have a chance to come down and see us some day. Yost, and our main Transp. Section Office, which as you know he heads, are located up in Munich at the Rear Headquarters. So you better tangle onto one of these visiting fireman expeditions—pardon me, I mean Congressman and torchsinger trips, and come on over and say hello.

"Had a letter from Taylor Lewis (Assoc.) several weeks ago; perhaps he has gone home by now. When last heard from he was up around Mannheim, a goodly distance from here.

"My best regards to any of my old friends. Take care of Connecticut until I get back and then I'll take over."

AN OPPORTUNITY !

Wanted by City of Dallas: Assistant Traffic Engineer. Graduation from college in some engineering field, preferably civil, and experience in traffic engineering work. Salary to be gauged by length and kind of experience. Apply: Civil Service Board, 309 City Hall, Dallas 1, Texas.

★ ★ ★

INSTITUTE ACTIVITIES 10 YEARS AGO

Taken from Traffic Engineering November, 1935

Lewis W. McIntyre named president of I.T.E.; Roger L. Morrison elected vice-president and Harold F. Hammond secretary-treasurer. . . . Purdue University to organize Institute of Public Safety for instruction in the latest traffic and public safety methods. . . . Four-lane roads seen as safe only with opposite traffic streams separated.

★ ★ ★

SURVEY SHOWS RISE IN ACCIDENTS AS VISIBILITY IS DECREASED

Richard E. Simpson, consulting engineer, Connecticut State Highway Commission, has just completed a survey of over 30 cities from San Francisco to Boston and Minneapolis to Birmingham. Excerpts: "There is a general agreement among those who have studied the subject that reduction in lighting below the point of good visibility, or failure to provide lighting up to this point on public ways, condemns a certain number of people to death and many others to injury through resultant increase in traffic accidents. . . . During 1944 and 1945 the pedestrian was the victim in three-fourths of all night fatalities. The day to night ratio of pedestrian fatalities was 1 to 6 in 1944 and 1 to 9 in 1945, a ratio increase of 50 per cent.

TRAFFIC SIGNALS by CROUSE-HINDS

TWO DIALS - TWO SPLITS - TWO CYCLES

Type GSDD Timer Only

Type GSDD Controller Complete

Yes, its virtually two controllers in one. The double dial feature permits the setting of two completely independent timing splits. The total cycle is separately adjustable on each dial, and it may be anything from 40 to 120 seconds. Each dial has a separate reset circuit for use when two or more type GSDD synchronous controllers are interconnected.

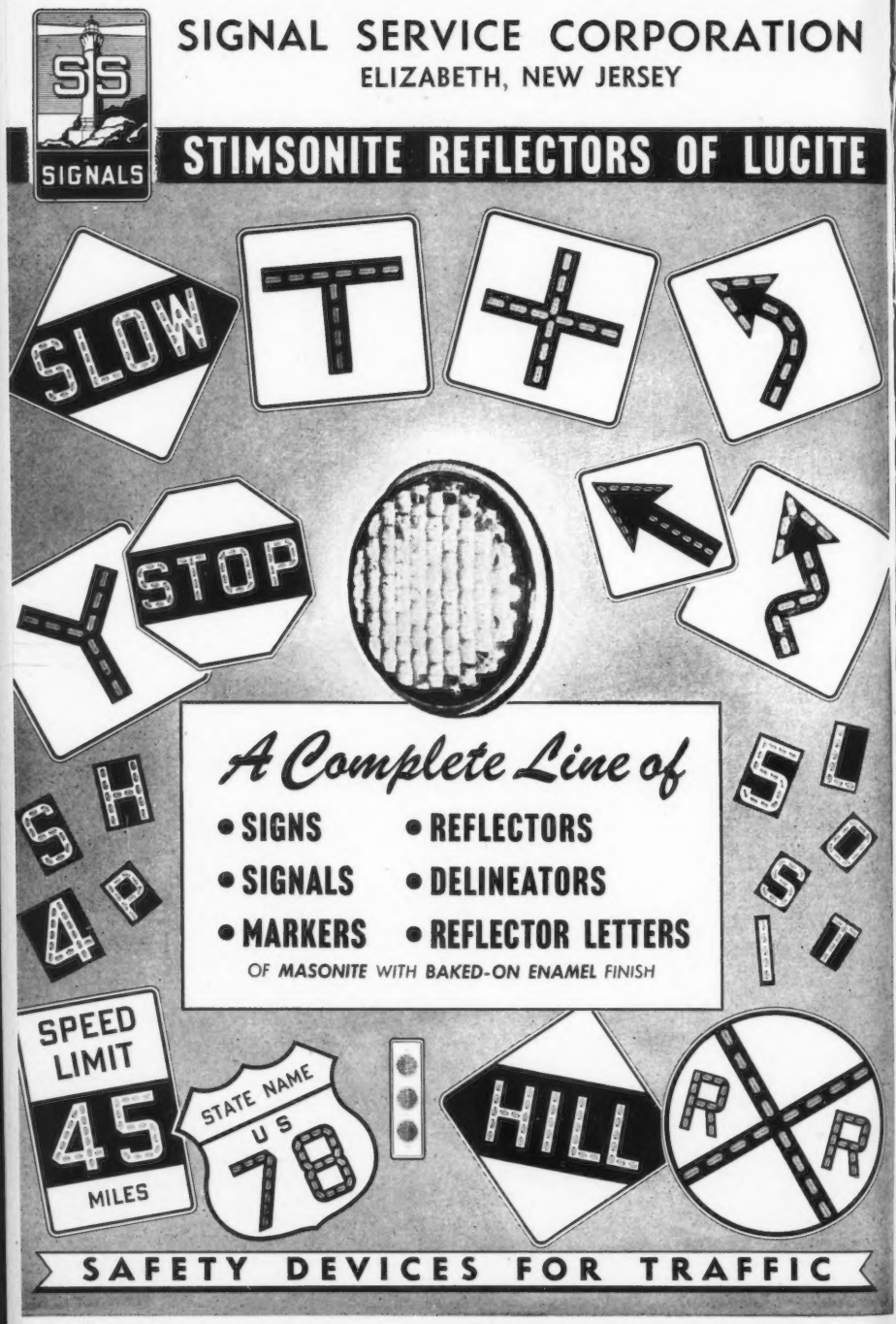
As an example of the flexibility of the type GSDD, the 15 circuit cam shaft can be set up and arranged for transfer from two movement to three movement operation. A simple contact lifting device replaces relays for this purpose. By means of a time switch, automatic change can then be made in the color sequence, timing split, and total cycle.

Thus, the type GSDD provides the equivalent to two controllers to meet the exacting requirements of "difficult" locations.

CROUSE-HINDS COMPANY
SYRACUSE 1, NEW YORK, U.S.A.

GO — CAUTION — STOP

When writing to advertisers, please mention TRAFFIC ENGINEERING


SS
SIGNALS
SIGNAL SERVICE CORPORATION
ELIZABETH, NEW JERSEY
STIMSONITE REFLECTORS OF LUCITE
SLOW
STOP
A Complete Line of
• SIGNS • REFLECTORS
• SIGNALS • DELINEATORS
• MARKERS • REFLECTOR LETTERS
OF MASONITE WITH BAKED-ON ENAMEL FINISH
SPEED LIMIT
45
MILES
STATE NAME
U S
78
HILL
R R
SAFETY DEVICES FOR TRAFFIC

PREVENTION OF ACCIDENTS DEPENDS ON INDIVIDUALS, NATIONAL SAFETY COUNCIL WARNS

Will 1946 bring the biggest accident toll in the nation's history?

Chances are it may, the National Safety Council has predicted, unless every person in the United States who doesn't want to get banged up in an accident goes to a little extra trouble to avoid one.

Announcing a coordinated program designed to reduce accidents of all kinds in the post-war months ahead, the Council emphasized that no such plan, no matter how strong, can possibly succeed unless the person most concerned gets in there and pitches. That person, the Council said, is—you!

Pooling of Resources

Plans for the campaign are well under way, the Council reported, with scores of national organizations pooling their resources in a joint effort to meet the post-war accident threat. Every type of accident is singled out for attack in the campaign, which is being developed along these lines:

Traffic—Forty eight national organizations have joined in a continuing effort to reduce traffic accidents by eliminating the causes of such accidents. Their activities are coordinated by the National Committee for Traffic Safety. This united program has been under way since long before the war ended.

Industry—A comprehensive plan for preventing accidents to workers on and off the job has been formulated by a committee representing 38 national organizations. Governmental agencies are cooperating actively.

Home—A program for preventing accidents in the home that far exceeds any previous effort is under way after more than a year of intensive study and activity. Many of the largest organizations in the country are working together on this.

Farm—The most intensive effort ever made to stop accidents to farm residents is well under way and is bringing results, despite difficult conditions due to the war. The government is active in this program.

School—Efforts begun during the war to enlist schools and teachers in a concerted attack on accidents to children of school age have resulted in a strong post-war program to reduce such accidents. Driver training is featured.

Up to the Individual

"Adding it all up," said Ned H. Dearborn, president of the Council, "we believe safety is in a position to crack down hard on post-war accidents of all kinds—if the person who may have one of these accidents is willing to do his part to avoid having it.

"We hear a lot about the size of the accident toll in 1946, when traffic really gets to rolling and the industrial reconversion reaches its peak. Actually, all these activities do not need to mean a single additional accident if the extra hazards are met with extra care.

"Safety leaders now know how accidents are caused and how they can be prevented. But, as with health rules or anything else, the knowledge doesn't mean a thing unless people are willing to put it to use.

"Safety is ready to carry out President Truman's call for united action in meeting the post-war accident threat. But it needs the help of the public."

President Truman's request for a concerted attack on the post-war accident problem was made in a letter to Mr. Dearborn.

"Peace has ended premeditated killing on the battlefront," said the President, "but it has not ended unin-

tentional killing, by accidents, on the home front. It has, in fact, ironically increased the accident toll.

"A nation great enough to win a war for freedom is great enough to preserve the freedom won. One of these freedoms is security from needless death, destruction and suffering. Accidents destroy this security. America proved during the war that accidents can be reduced, even under the most difficult conditions, if we really want to reduce them. It is unthinkable that the nation will lose the war against accidents after winning the war against the Axis. This must not and shall not happen.

"I therefore call upon the officers and directors of the National Safety Council to continue into the period of peace the assignment the Council received and so ably carried out in the period of war—the mobilization of the safety forces of the Nation in a united campaign against accidents of all kinds.

"I call upon every citizen, in whatever capacity, to join this campaign."

COMPARISON OF WAR AND ACCIDENT CASUALTIES

From Pearl Harbor (Dec. 7, 1941) to V-J Day (Aug. 14, 1945)

WAR CASUALTIES

(From the Army and Navy)

Killed	261,608
Wounded	651,911
Missing	32,811
Prisoners	124,194
Total	1,070,524

THE HOME FRONT ACCIDENT TOLL

(From the National Safety Council)

Killed	355,000
Injured	36,000,000

(Including 1,250,000 cases involving some permanent disability)

Accident Toll to Workers Alone

(On and off the Job)

Killed on the job	66,000	Total workers killed on	
Killed off the job	94,000	and off the job	160,000
Injured on and off the job			15,000,000

(Including 560,000 cases involving some permanent disability)

The Traffic Toll Alone

Killed	94,000
Injured	3,300,000

(Including 270,000 cases involving some permanent disability)

The Toll in Homes Alone

Killed	118,000
Injured	17,500,000

(Note: The National Safety Council offers the foregoing comparison with no thought of implying that wartime activities on the home front compared in danger with actual fighting on the battle front. The figures are presented merely to show the enormity of the accident toll and to emphasize the importance of preventing accidents—in war or in peace.)

NOW IN PRODUCTION
Prompt Shipment Assured

U. S. Standard Stop With Latest Revised Letters

THE GROTE MANUFACTURING CO.
Incorporated
BELLEVUE, KENTUCKY

COUNTIES Solve
Traffic Problems With
Traficounter

The Traficounter is used by scores of county highway departments throughout the country. Here is a typical comment, from the office of a county highway engineer regarding the excellent use being made of these precision built instruments.

"We have four Traficounters and find that they are a great help in getting continuous traffic count of certain sections of road. Our County road system is surfaced largely with pit run gravel and we have now reached a stage where—in our Post-War construction—we will have to do considerable regrading and bituminous surfacing.

"Traffic counts taken before gasoline rationing are proving valuable in determining what roads should be included in this program from a traffic standpoint."

This "lightning fast" automatic counter of motor traffic consists essentially of an electric counter and recorder which registers the count of cars that pass the detector. **Streeter - Amet Company, 1726 Belle Plaine Avenue, Chicago 13, Illinois.**

STREETER-AMET

When writing to advertisers, please mention TRAFFIC ENGINEERING

DATA ON TOLL-FACILITY CHARGES COMPILED BY PUBLIC ROADS ADMINISTRATION

The Public Roads Administration maintains a continuing interest in highway toll facilities. It attempts to maintain up-to-date records on the number of each type in use, their ownership status, the volume of traffic utilizing them, and the income collected by them. However, the large number of facilities in operation, their wide geographic distribution, and the large number of individual public or private owners involved render it impossible to keep the compiled information as current as would be desirable. The latest compilations show that in 1940 there were in operation within the continental limits of the United States 240 toll bridges, six toll tunnels, 561 toll ferries, and 25 toll roads—a total of 832 toll facilities. Of these county governments owned and operated 10 bridges and 40 ferries; townships owned and operated two ferries; incorporated places owned and operated nine bridges, one tunnel, and five ferries; and a county and city together owned and operated one toll road. The total number of facilities owned and operated by counties and local units was 68. This number does not include toll facilities in metropolitan areas owned and operated by states or by especially created public authorities or commissions, and this group of toll facilities is not considered in this article.

Collections During 1940

It is estimated that during 1940 the toll revenues collected by counties and local units from the toll facilities listed above amounted to more than $4,640,000. Counties collected almost $1,500,000; $1,330,000 from bridges and $170,000 from ferries. Incorporated places collected a little more than $3,050,000; $1,870,000 from bridges, $1,070,000 from one tunnel, and slightly more than $110,000 from ferries. The joint county-city toll road yielded nearly $90,000 in tolls collected. The income from the township-owned ferries was negligible, only a little more than $1,000.

★ ★ ★

HOW MUNICIPALITIES MAY OBTAIN HIGHWAY FUNDS

Procedure to be followed by municipalities in qualifying for funds from the Federal aid highway program: (1) "urban areas" are to be established; (2) the highway system in each community must be defined (these are in three classes: (a) urban extensions of the new National System of Interstate Highways, (b) urban extensions of the regular federal aid or primary system, (c) extension of the federal-aid secondary system in municipalities of less than 5,000 population which are not included in an urban area); and (3) an interim list of priority projects must be established. First step is to approach state highway department through state league of municipalities.

★ ★ ★

STAGGERED HOURS PROGRAM MOVING AHEAD IN CHICAGO

Organization of two sub-committees to direct traffic engineering and public information activities of the Mayor's Committee for Staggered Hours in Chicago has been perfected.

Voluntary extension and expansion of the wartime staggered hours program is being urged by the Mayor's committee to minimize traffic hazards and delays resulting from the lifting of wartime controls on automobile travel.

Leslie J. Sorenson, city traffic engineer, is chairman of the traffic engineering sub-committee.—*Passenger Transport.*

THE HUNT COMPANY · MICH · EST. 1920 DETROIT 21

HIGHWAY SIGNS
STREET NAMES
PARKING SIGNS
STOP SIGNS

CATALOGUE ON REQUEST

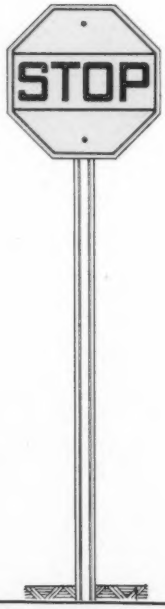
All signs embossed on U. S. Standard 16 gauge Steel. Baked-enamel Colors.

PROMPT DELIVERY OF ALL ORDERS

POSTS

STANDARD HIGHWAY SIGN POSTS

7 ft., 6 in.
10 feet
12 feet



The Hunt Company, 2405 W. McNichols Road, Detroit 21, Mich.

POLICE CHIEFS TO MEET DECEMBER 10-13

The 52nd annual conference of the International Association of Chiefs of Police will be held December 10, 11, 12 and 13 in Miami Beach, Fla. Conference headquarters will be at the Shelborne Hotel. More than a thousand police administrators are expected to attend from all parts of the United States, from Canada, England and the Latin American countries.

Immediate problems of the early months of peace and long range plans, possible only since the war's end, will fill the program of the sessions for city police administrators and for state and provincial chiefs during the four-day meeting. The restoration of the four-day session will also permit delegates time to gather socially during the conference, an opportunity limited during the war when the annual meetings were cut to three days.

Gen. Draper to Preside

Brig. Gen. D. Colburn Draper, chief constable of Toronto, Ont., Can., and the IACP'S last wartime president, will preside at the general sessions. Commissioner Edward J. Hickey, general chairman of the Association's State and Provincial Section, will preside at the sessions for this section. Robert E. Raleigh, director of the IACP Safety Division, will report on the Division's activities for the fifteen months since the 1944 conference was held. The report will include facts and sidelights on the IACP Nationwide Brake Emphasis Program, conducted from April 15 to June 1, 1945, the first united police traffic program.

Representatives of the Federal Bureau of Investigation,the United States Secret Service and the Army will appear on the program.

Those planning to attend the conference are urged to make hotel reservations as early as possible through the Shelborne Hotel, 1801 Collins Ave., Miami Beach, Fla.

CLEVELAND TRANSIT SYSTEM IMPROVEMENTS PROPOSED

The replacement of a large number of street cars by gasoline buses and trolley coaches is the highlight of Cleveland's improved transit system as proposed by the engineering firm of DeLeuw, Cather & Company, after a six-month survey of the city's transit needs. The plan calls for an initial outlay of $10,000,000 with an additional $12,500,000 recommended for a mile-and-a-half link subway and two more underground terminals.

The rail system would be fed by buses and trackless trolleys in addition to bus lines running downtown over present and proposed roadways, according to Charles E. DeLeuw. Under the proposed plan, trackless trolleys and gas buses will become the backbone of the system. A total of 885 buses and trackless trolleys would be required.

Differs from Earlier Plan

Principal difference between the DeLeuw plan and the $40,000,000 Reed-McCarter plan which was introduced a year ago is that the latter called for a downtown subway loop, while the DeLeuw recommendations propose the subway connecting link. The DeLeuw plan calls for spending $19,000,000 for equipment, bringing the total cost to $41,500,000, while the Reed-McCarter program proposed $22,930,000 for rolling stock, or a total of $62,930,000.

"I believe there is a good chance to get this plan approved," said Walter J. McCarter, general manager of the Cleveland Transit System, "especially

if it is emphasized that the first stage running into the Terminal would cost only $10,000,000."

Whether buses or trackless trolleys are to be used on feeder lines and in areas not served by the rapid transit is left to the discretion of the transit management. Mr. DeLeuw made no recommendation in this respect other than to indicate 32 or 44-passenger vehicles were preferred. The transit system now has on order 50 additional trackless trolleys and 100 large buses. The report pointed out that the great bulk of the transit vehicles was due for retirement. There are now in service 770 motor street cars and 206 trailers. All except 207 of the motor cars were built 20 or more years ago.

BIRMINGHAM TO ABANDON 15 STREET CAR LINES

Modernization of Birmingham's public transportation system, held up by wartime restrictions will begin immediately, it is announced by William M. Rogers, president of the Birmingham Electric Company. The huge program calls for the expenditure of approximately $3,000,000 and provides for conversion of some 15 street car lines to rubber-tired vehicle operation.

Mr. Rogers said that the improvement in the city's transit system would be made as fast as material could be obtained and added that when the proposed transit program is completed, Birmingham will have a modern transportation system comparable to any in the South. Delivery of eleven 44-passenger buses was made during September and 20 additional vehicles are promised before January 1946. Trackless trolleys will be introduced on several street car lines in the Spring, and the tracks will be removed to make way for new trolley coaches.

"Our program for modernizing Birmingham's transportation system has been carefully developed with a view of giving this community and environs a completely modern and efficient service," Mr. Rogers explained. "This program is a flexible one. As Birmingham develops and population shifts occur, many other improvements will be indicated. These will be worked out in cooperation with residents of areas involved and public authorities.

"A modern transportation system in a metropolitan community such as Birmingham involves the use of three types of urban transit equipment. These are motor coaches, street cars, and trackless trolleys. In each instance the type of equipment should be selected that is best adapted to the particular conditions of riding and traffic on the route where it will be used. This is true especially in a widely spread area like Birmingham, where transit conditions present many problems unlike those in other metropolitan areas."

★ ★ ★

AUTOMOBILE STILL LEADS IN TRAVEL

Private automobiles carried a greater volume of passenger travel during the war than all other forms of transportation combined, according to estimates reported by the National Highway Users Conference. And this in spite of the fact that gas and tire rationing and other wartime shortages had eliminated most of the pre-war pleasure and tourist travel.

Travel in private automobiles in 1944 totaled 275,000,000,000 passenger miles, it is estimated, compared to 96,000,000,000 by steam railroads, 57,924,000,000 by motor buses, 36,400,000,000 by electric railways, 28,267,000,000 by Pullman cars and 2,230,000,000 by domestic airlines.

Freight transportation in 1944 is estimated at 45,900,000,000 ton-miles by commercial motor vehicles, 740,000,000,000 by steam railroads, 118,000,000,000 on the Great Lakes, 110,000,000,000 by pipe lines and 27,000,000,000 by inland waterways. Rail transport was 55 per cent and truck transport four per cent over the 1941 pre-war figures.—

"Our People won't pay for Good Street Lighting"

DON'T YOU BELIEVE IT!

Everyone pays for street lighting whether he has it or not...and the poorer the street lighting the more he pays.

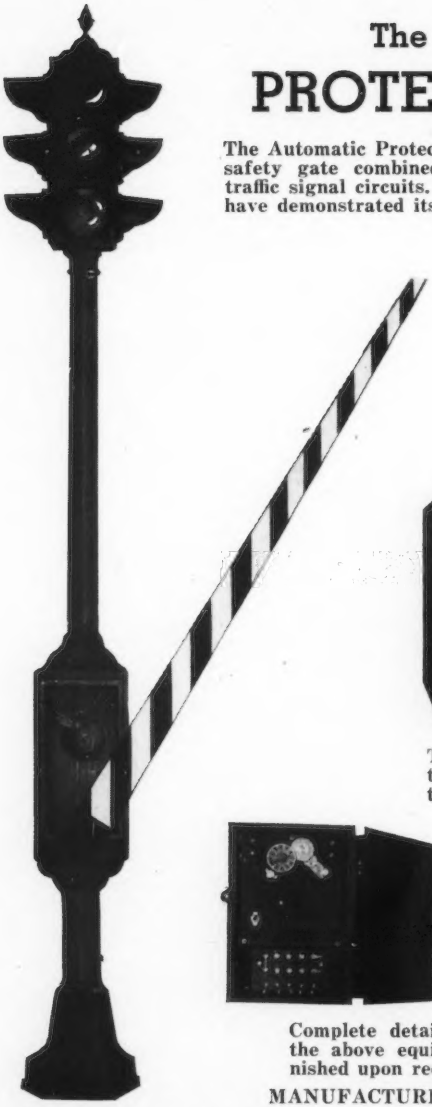
Some of the cheapest street lighting installations in America are costing the most ...in wasted power...in frequent traffic accidents and high insurance rates...in an unfair burden on the police, fire departments and hospitals...in lost opportunity for community growth.

Old-fashioned, ornate lighting which was installed primarily for "show" may have been an expense to the taxpayer — but today's scientific street lighting returns a cash profit to the community. It encourages night window shopping; keeps local buyers in their own community, and attracts out-of-town trade; gives a sense of security to those who must use the streets at night; cuts crime; reduces traffic accidents; and increases real estate values.

Give your citizens the facts. Show them how they can benefit through adequate *modern* street lighting...and watch all objections to its low initial cost vanish.

For details on improved equipment, and new street lighting methods...for news of what neighboring communities are doing ...for facts on costs *and savings*—contact your electric utility company today. Or write The Street and Traffic Safety Lighting Bureau, 155 E. 44th St., New York 17, N.Y.

GOOD STREET LIGHTING • THE SIGN OF A GOOD PLACE TO *LIVE!*



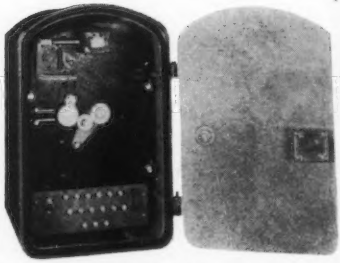
The Automatic

PROTECT-O-ARM

The Automatic Protect-O-Arm consists of an improved safety gate combined and controlled from standard traffic signal circuits. Its effectiveness and popularity have demonstrated its place in the safety field.

TRAFFIC SIGNAL CONTROLS

Designed and manufactured according to standard or individual specifications.



Type 99-RM5—Traffic signal controller, equipped for remote operation.

Type 99-A — Standard. 6 - circuit. synchronous, heavy duty traffic signal control.

Complete detailed information on the above equipment will be furnished upon request.

MANUFACTURED BY

Southern Switch & Signal Co.

Shreveport, Louisiana

"THERE IS NO SUBSTITUTE FOR EXPERIENCE"

NATIONAL SAFETY COUNCIL

NATIONAL SAFETY COUNCIL

The above cartoons are part of a joint effort by 40 national organizations represented on the National Committee for Traffic Safety to wage a campaign to remove the causes of traffic accidents. Mats may be obtained by writing to Paul Jones, Director of Public Information, National Safety Council, 20 North Wacker Drive, Chicago.

A GUIDE POST IN PLANNING TOMORROW'S HIGHWAYS
TUTHILL HY-WAY GUARD
The Spring Cushions the Shock
TUTHILL Guard Rails have these unique features:
1. Convex, deflective surface.
2. Strong steel springs to resist impact.
3. High visibility, greater safety.
4. Low mounting of brackets.
5. Standard lengths, easy installation.
In making plans for post-war highway construction, be sure to include TUTHILL, the safer Guard Rail. Its high visibility warns motorists. Its convex surface deflects cars or trucks. Its spring-like action absorbs shocks, lessens damage, lowers upkeep. Why be without these definite TUTHILL advantages?
Pacific Coast Manufacturers and Distributors
U. S. SPRING & BUMPER CO.
Los Angeles, Cal.
Special Notice!
TUTHILL Guard Rails are now available!
REQUEST DETAILS
TUTHILL SPRING COMPANY
764 POLK ST...CHICAGO 7 ILL.

Eagle Signal Appoints Peterson Sales Manager

The Eagle Signal Corporation of Moline, Illinois, manufacturers of traffic signals, has announced the appointment of W. H. Peterson as sales manager of the Municipal Division to succeed W. F. Benson, who resigned to enter another field of business in his home city, Grand Rapids, Mich.

Mr. Peterson, an engineer, has been associated with the Eagle Signal Corporation for more than 15 years. He was assistant sales manager of the Municipal Division for the past ten years. During this time he has become well known in traffic signal work, and among members of the I.T.E.

Before entering the sales department Mr. Peterson was in the engineering and also the inspection departments of the company, where he gained a wide background in electrical, mechanical and traffic engineering experience. He is thoroughly familiar with all phases of traffic control, including pretimed and vehicle-actuated equipment. He has solved many traffic control problems in the field.

Civilian Production Resumed

The Eagle Signal Corporation is again devoting all of its efforts to the production of traffic signals, controllers, timing equipment, and related products. This was halted when war started, and Eagle then turned its facilities and manpower to the adaptation of its products to war uses.

Statement of ownership, management, circulation, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Traffic Engineering, published monthly at Plainfield, New Jersey, for October 1, 1945.

State of New York }
County of New York }

Before me a Notary Public in and for the State and County aforesaid, personally appeared Richard W. Siver, who, having been duly sworn according to law, deposes and says that he is the editor of Traffic Engineering and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, to wit:

1. That the names and address of the publisher, editor, managing editor, and business managers are:

Publisher—Institute of Traffic Engineers, 400 Watchung Avenue, Plainfield, New Jersey:

Editorial Office, 60 John Street, New York 7, N. Y.

Editor—Richard W. Siver, 60 John Street, New York 7, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and address of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation the names and address of the individual owners must be given. If owned by a firm, company or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

Institute of Traffic Engineers, 311 Strathcona Hall, New Haven, Connecticut.

Thomas J. Seburn, President, City Hall, Kansas City, Missouri.

Robert A. Mitchell, Vice President, City Hall, Philadelphia, Pennsylvania.

Wilbur S. Smith, Secretary-Treasurer, Yale University, New Haven, Connecticut.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders, as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustees or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustee, hold stock and securities in a capacity other than that of a bonafide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies, of each issue of this publication, sold or distributed through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is ..... (This information is required from daily publications only.)

RICHARD W. SIVER,
Editor.

Sworn to and subscribed before me this 9th day of October, 1945.

JUNE McGRANE
Notary Public

Queens Co. Clk's No. 1611, Reg. 29-Mc-7.
Certificates filed in N. Y. Co. Clk's No. 87, Reg. No. 38-Mc-7. Commission Expires March 30, 1947.

RING

epart-
engi-
n de-
ere he
trical,
ng ex-
miliar
ol, in-
tuated
y traf-
.

ion is
to the
ontrol-
related
en war
ed its
adap-
ses.

er, Yale
, mort-
wning or
amount
ties are:
t above,
kholders,
not only
holders,
the com-
ckholder
books of
other fi-
erson or
s acting,
ragraphs
nt's full
mstances
ders and
upon the
old stock
han that
iant has
r person,
interest
bonds, or
y him.
copies, of
l or dis-
rwise, to
e months
daily pub-
VER,
Editor.
e this 9th
E
lic
29-Mc-7.
's No. 87,
res March